SPECIFICATIONS

SECTION 01 35 43

ENVIRONMENTAL PROCEDURES

PART 1 - GENERAL

1.01 SCOPE

A. The work covered by this section consists of furnishing all labor, materials and equipment, and performing all work required for the prevention of environmental pollution and the handling, removal, transportation and disposal of any hazardous and/or regulated solid waste generated during and as the result of construction operations under this contract except for those measures set forth in other provisions of these specifications. For the purpose of this specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents, which adversely affect human health or welfare; unfavorably alter ecological balances of importance to man; or degrade the utility of the environment for esthetic and recreational purposes. The control of environmental pollution requires consideration of air, water, and land, and in solid waste-management, management of radiant energy and radioactive materials, as well as other pollutants including hazardous wastes, materials, substances and chemicals.

1.02 RELATED DOCUMENTS

A. Section 31 11 00: Clearing and Grubbing ❑

B. Section 31 23 36: Grading, Excavation and Backfill ❑

1.03 APPLICABLE REGULATIONS

A. In order to prevent, and to provide for abatement and control of any environmental pollution arising from construction activities in the performance of this contract, the Contractor and his subcontractors shall comply with all applicable Federal, State, and Local laws concerning environmental pollution control and abatement and any regulations referred to in the following paragraphs.

1. Tennessee Code Annotated, § 11-13-116 "Water Pollution Control."

2. Tennessee General Permit No. TNR100000, "Storm Water Discharges from Construction Activities."

B. For hazardous wastes, materials, substances and chemicals applicable regulations shall include, but are not limited to:

1. Tennessee Department of Environment and Conservation, Division of Solid Waste, TDEC Rule 1200-1-11 "Hazardous Waste Management Regulations."

2. Tennessee Code Annotated, § 68-212 "Hazardous Waste Management"

3. Code of Federal Regulations:

a. 29 CFR 1910.106 - "Flammable and Combustible Liquids."

b. 29 CFR 1910.120 - "Hazardous Waste Operations and Emergency Response."

c. 29 CFR 1910.1200 - "Hazardous Communications."

d. 40 CFR 260-268 - "Hazardous Waste Management System: General."

e. 40 CFR 279 - "Standards for the Management of Used Oil."

f. 40 CFR 355 - "Emergency Planning and Notification."

g. 40 CFR 372 - "Toxic Chemical Release Reporting: Community Right-To-Know."

h. 49 CFR 171-178 - "Transportation of Hazardous Materials."

1.04 MEASUREMENT AND PAYMENT

A. Environment Protection - Payment for the work covered under this section shall be included within the applicable bid items.

B. Hazardous/Regulated Waste -

1. If the Contractor generates hazardous and/or regulated solid wastes through his/her actions, no separate measurement or payment will be made for handling, removal, transportation and disposal of hazardous and/or regulated solid wastes. Payment for the work associated with and the disposal of hazardous/regulated solid wastes generated by the Contractor shall be distributed throughout the existing bid items.

2. If the Contractor uncovers an existing hazardous/regulated waste not Contractor generated, not shown on the drawings, and not specified herein, the Contractor shall notify the Engineer immediately. Payment for the handling, removal, transportation and disposal of hazardous and/or regulated solid wastes not Contractor generated, not shown on the drawings, and not specified herein will be made as an equitable adjustment in the contract.

1.05 QUALITY CONTROL

A. General

The Contractor shall establish and maintain quality control for environment protection to assure compliance with contract specifications and maintain records of his quality control for all construction operations including but not limited to the following:

1. Submit Plan of Environment Pollution Control. For Contractor work activities (such as painting, metal finishing, etc.) that will involve bringing hazardous chemicals, hazardous substances or hazardous materials onto the project site, include in the Plan a Hazard Communication Program and Safe Storage Plan. For Contractor activities that anticipate generation of hazardous wastes at the project site, include in the Plan a waste identification/determination and waste disposal plan. For Contractor on-site activities that pose a risk of an oil or

hazardous substance spill, include in the Plan a Spill Reporting and Response Plan.

2. Procure applicable Federal, State and Local regulations on pollution control.

3. Air Pollution - Checks made on dust, smoke, and noise.

4. Water Pollution - Checks made on disposal of water, oil, etc.

5. Land Pollution - Checks made on disposal of debris, restoration of temporary construction sites, etc.

6. Training Course for Employees.

B. Reporting

1. The original and two copies of these records, as well as the records of corrective action taken, shall be furnished to the Engineer.

1.06 NOTIFICATION

A. The Engineer will notify the Contractor in writing of any non-compliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess cost of damages by the Contractor.

1.07 SUBCONTRACTORS

A. Compliance with the provisions of this section by subcontractors will be the responsibility of the Contractor.

1.08 IMPLEMENTATION

A. Within 10 days after receipt of a Notice to Proceed, or otherwise directed below, the Contractor shall:

1. Submit a written proposal for implementing environmental pollution control at the project site, disposal of debris, non-hazardous wastes and hazardous wastes generated at the project site as well as storage and management of regulated materials, substances and chemicals brought onto and used at the project site.

2. Meet with representatives of the Engineer to develop mutual understanding relative to compliance with this provision and administration of the environmental pollution control program.

3. If applicable, submit a plan for the handling, removal, transportation and disposal of hazardous and/or regulated solid wastes generated because of the Contractor's operation.

B. Environmental Assessment of Contract Deviations

1. The Contractor is advised that deviations from the drawings or specifications (e.g., proposed alternate borrow areas, disposal areas, staging areas, alternate access routes, etc.) could result in the requirement for the Engineer to reanalyze the project from an environmental standpoint. Deviations from the construction methods and procedures indicated by the plans and specifications, which may have an environmental impact will require an extended review, processing, and approval time. The Engineer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Engineer determines that the proposed alternate method will have an adverse environmental impact.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 PROTECTION OF LAND RESOURCES

A. General

1. The land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the project. The Contraction shall confine construction activities to areas defined by the plans or specifications, including borrow areas to be cleared.

B. Prevention of Landscape Defacement

1. Except in areas to be cleared and provided in Section 3.01C below, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without the approval of the Engineer. Felling of trees shall be performed in such a manner as to avoid damage to trees to be left standing. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's operations or equipment; he shall protect adequately such trees. Earth that is displaced into uncleared areas shall be removed. All monuments and markers shall be protected before beginning operations near them. Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the Contractor's expense. Trees that are scarred shall be immediately painted with an acceptable tree wound paint. Any trees that are damaged beyond restoration shall be removed and disposed of as directed in Section 3.05.

C. Temporary Excavation and Embankments

1. If the Contractor proposes to construct temporary roads or embankments and excavation for plant and/or work areas, he shall obtain approval of the Engineer prior to start of such temporary work.

D. Post-Construction Cleanup or Obliteration

1. The Contractor shall obliterate all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, and stockpiles of

excess or waste materials upon completion of construction. The Contractor will be required to restore the construction area to near natural conditions that will permit the growth of vegetation.

E. Recording and Preserving Historical and Archeological Finds

1. All items having any apparent historical or archeological interest that are discovered in the course of any construction activities shall be carefully preserved. The Contractor shall leave the archeological find undisturbed and shall immediately report the find to the Engineer so that the proper authorities may be notified.

3.02 PROTECTION OF WATER RESOURCES

A. Contamination of Water

1. The Contractor shall not pollute lakes, ditches, rivers, canals, groundwater, waterways, or reservoirs with fuels, oils, bitumens, calcium chloride, insecticides, herbicides, or other similar materials harmful to fish, shellfish, or wildlife, or materials which may be a detriment to outdoor recreation.

B. Disposal of Materials

1. The methods and locations of disposal of materials, wastes, effluents, trash, garbage, oil, grease, chemicals, etc., within the right-of-way limits shall be such that harmful debris will not enter lakes, ditches, rivers, canals, groundwater, waterways, or reservoirs by erosion, and thus prevent the use of the area for recreation or present a hazard to wildlife.

C. Erosion Control

1. Surface drainage from cuts and fills within the construction limits, whether or not completed, and from borrow and waste disposal areas, shall, if turbidity producing materials are present, be held in suitable sedimentation ponds or shall be graded to control erosion within acceptable limits. Temporary erosion and sediment control measures shall be provided and maintained until permanent drainage and erosion control facilities are completed and operative. The area of bare soil exposed at any one time by construction operations shall not exceed that necessary to perform the work. Stream crossings by fording with equipment shall be limited to control turbidity and in areas of frequent crossings temporary culverts or bridges shall be installed. Any temporary culverts or bridges shall be removed upon completion of the project. Fills and waste area shall be constructed by selective placement to eliminate silts or clays on the surface that will erode and contaminate adjacent streams.

3.03 PROTECTION OF FISH AND WILDLIFE

A. The Contractor shall at all times perform all work and take such steps required to prevent any interference or disturbance to fish and wildlife. The Contractor will not be permitted to alter water flows or otherwise disturb native habitat adjacent to the project area that are critical to fish or wildlife. Any time a colony of nesting birds is discovered in the course of any construction activities, the colony should not be disturbed (i.e., no work within 1,500 feet), and the Contractor shall immediately report the findings to the

Engineer so that the U. S. Fish and Wildlife Service or the Tennessee Wildlife Resources Agency may be notified.

3.04 JANITOR SERVICES

A. The Contractor shall furnish daily janitorial services for all the offices, shops, laboratories, or other buildings being used by the Contractor whether existing or Contractor furnished, and perform any required maintenance of the facilities and grounds during the life of the contract. Toilet facilities shall be kept clean and sanitary at all times. Services shall be performed at such a time and in such a manner to least interfere with the operations but will be accomplished only when the buildings are in daily use. Services shall be accomplished to the satisfaction of the Engineer. The Contractor shall also provide weekly trash collection and cleanup of the buildings and adjacent outside areas, snow removal as required, and shall dispose of all discarded debris, aggregate samples and concrete test samples in a manner approved by the Engineer.

3.05 DISPOSAL OF NON-REGULATED DEBRIS

A. All debris resulting from construction operations on this contract shall be disposed of in accordance with Section 31 11 00 "Clearing and Grubbing."

3.06 DISPOSAL OF HAZARDOUS AND/OR REGULATED SOIL WASTES

A. If any hazardous or regulated solid wastes will be generated as a result of the Contractor's operations, the Contractor shall submit a plan that details the proper handling, removal, transportation and disposal of such wastes. The plan shall identify what types of hazardous and/or regulated solid wastes will be generated and shall list the hazards involved with each waste. All waste generated on-site by the Contractor must be properly identified within 30 days of generation. No regulated wastes shall be allowed to accumulate on-site for more than 90 days. The plan shall include Material Safety Data Sheets (MSDS), if applicable, for all wastes expected to be generated. The plan shall include, but not be limited to the following:

1. Hazardous waste shall be placed in closed containers and shall be shielded adequately to prevent dispersion of the waste by wind or water. Any evidence of improper storage shall be cause for immediate shutdown of the project until corrective action is taken.

2. Non-hazardous waste shall be stored in containers separate from hazardous waste storage areas.

3. All hazardous waste shall be transported by a licensed transporter in accordance with Tennessee Code Annotated, § 68-212, and TDEC Rule 1200-1-11.

4. All non-hazardous waste shall be transported in accordance with Local regulations regarding waste transportation.

5. In addition to the number of manifest copies required by TDEC, one copy of each manifest will be supplied to the Engineer prior to transportation.

6. The plan shall identify what types of hazardous and/or regulated solid wastes will be generated and shall list the hazards involved with each waste.

B. Hazardous Waste

1. For the handling, removal, transportation and disposal of any generated hazardous waste, the plan shall conform to the requirements of 29 CFR 1910.120. All employees of the Contractor or subcontractors that will be directly involved in the handling and/or removal of hazardous wastes shall be trained in accordance with 29 CFR 1910.1200. In addition, the employees shall have undergone a medical evaluation in accordance with 29 CFR 1910.1200. The Contractor shall include copies of employees' certifications and medical examinations as part of the plan specified herein. The plan shall also address the proper Personnel Protective Equipment (PPE) that the employees will be required to wear during the handling and removal of hazardous wastes. The Contractor shall obtain an EPA ID# and Hazardous Waste Disposal Manifests and shall sign the manifests as the generator. Wastes shall be transported via State and Federal approved hazardous waste transporter and disposed of at a State and Federal approved temporary, storage and disposal (TSD) facility. Copies of licenses and certifications of the transporter and TSD shall be included in the plan. The plan shall list the name and address of each transporter and TSD to be utilized. The Contractor shall be responsible for any sampling and analysis required by the TSD for characterization purposes. The Contractor shall submit to the Engineer completed copies of all Hazardous Waste Disposal Manifests within five (5) days after ultimate disposal at the TSD. Other regulations applicable to the handling, removal, transportation and disposal of hazardous wastes are: 40 CFR 261 "Identification and Listing of Hazardous Wastes"; 40 CFR 262 "Standard Applicable to Generators of Hazardous Wastes"; 40 CFR 268 "Land Disposal Restrictions".

C. Regulated Solid Wastes

1. For the handling, removal, transportation and disposal of any generated regulated solid wastes, the plan shall conform to the requirements of the TDEC Rule 1200-1-11. Solid wastes shall be transported to a Federal and State approved TSD, oil recycler or Industrial Type Landfill. The Contractor shall identify in the plan how he/she intends to dispose of each solid waste. The plan shall include the name, address, licenses and certifications of each disposal facility that will be used. If disposal manifests are required, the Contractor shall sign them as the generator. The Contractor shall be responsible for sampling and analyses that may be required by the disposal facility(ies) for characterization purposes. Licenses and certifications of the transporter and disposal facilities shall be included in the plan. The Contractor shall submit to the Engineer a completed copy of any waste disposal manifests within five (5) days after ultimate disposal.

D. Laboratory Accreditation.

1. All laboratory testing for waste determination shall be performed by a laboratory which is approved by the Tennessee Department of Environment and Conservation. The name and address of the laboratory shall be included in the Waste Classification, Handling, and Disposal Plan.

3.07 MAINTENANCE OF POLLUTION CONTROL FACILITIES

A. During the life of this contract, the Contractor shall maintain all facilities constructed for pollution control under this contract as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to

the extent that pollution is no longer being created. Early in the construction period, the Contractor shall conduct a training course that will emphasize all phases of environmental protection.

3.08 REPORTING OF POLLUTION SPILLS

A. In the event that an oil spill or chemical release occurs during the performance of this contract, the Contractor is required to contact the **National Response Center, telephone number 1-800-424-8802** as soon as possible. The Contractor shall comply with any instructions from the responding agency concerning containment and/or cleanup of the spill.

***** END OF SECTION *****

SECTION 01 35 43

ENVIRONMENTAL PROCEDURES

PART 1 - GENERAL

1.01 SCOPE

A. The work covered by this section consists of furnishing all labor, materials and equipment, and performing all work required for the prevention of environmental pollution and the handling, removal, transportation and disposal of any hazardous and/or regulated solid waste generated during and as the result of construction operations under this contract except for those measures set forth in other provisions of these specifications. For the purpose of this specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents, which adversely affect human health or welfare; unfavorably alter ecological balances of importance to man; or degrade the utility of the environment for esthetic and recreational purposes. The control of environmental pollution requires consideration of air, water, and land, and in solid waste-management, management of radiant energy and radioactive materials, as well as other pollutants including hazardous wastes, materials, substances and chemicals.

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PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 PROTECTION OF LAND RESOURCES

A. General

1. The land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the project. The Contraction shall confine construction activities to areas defined by the plans or specifications, including borrow areas to be cleared.

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1. If the Contractor proposes to construct temporary roads or embankments and excavation for plant and/or work areas, he shall obtain approval of the Engineer prior to start of such temporary work.

D. Post-Construction Cleanup or Obliteration

1. The Contractor shall obliterate all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, and stockpiles of

excess or waste materials upon completion of construction. The Contractor will be required to restore the construction area to near natural conditions that will permit the growth of vegetation.

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1. All items having any apparent historical or archeological interest that are discovered in the course of any construction activities shall be carefully preserved. The Contractor shall leave the archeological find undisturbed and shall immediately report the find to the Engineer so that the proper authorities may be notified.

3.02 PROTECTION OF WATER RESOURCES

A. Contamination of Water

1. The Contractor shall not pollute lakes, ditches, rivers, canals, groundwater, waterways, or reservoirs with fuels, oils, bitumens, calcium chloride, insecticides, herbicides, or other similar materials harmful to fish, shellfish, or wildlife, or materials which may be a detriment to outdoor recreation.

B. Disposal of Materials

1. The methods and locations of disposal of materials, wastes, effluents, trash, garbage, oil, grease, chemicals, etc., within the right-of-way limits shall be such that harmful debris will not enter lakes, ditches, rivers, canals, groundwater, waterways, or reservoirs by erosion, and thus prevent the use of the area for recreation or present a hazard to wildlife.

C. Erosion Control

1. Surface drainage from cuts and fills within the construction limits, whether or not completed, and from borrow and waste disposal areas, shall, if turbidity producing materials are present, be held in suitable sedimentation ponds or shall be graded to control erosion within acceptable limits. Temporary erosion and sediment control measures shall be provided and maintained until permanent drainage and erosion control facilities are completed and operative. The area of bare soil exposed at any one time by construction operations shall not exceed that necessary to perform the work. Stream crossings by fording with equipment shall be limited to control turbidity and in areas of frequent crossings temporary culverts or bridges shall be installed. Any temporary culverts or bridges shall be removed upon completion of the project. Fills and waste area shall be constructed by selective placement to eliminate silts or clays on the surface that will erode and contaminate adjacent streams.

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A. The Contractor shall at all times perform all work and take such steps required to prevent any interference or disturbance to fish and wildlife. The Contractor will not be permitted to alter water flows or otherwise disturb native habitat adjacent to the project area that are critical to fish or wildlife. Any time a colony of nesting birds is discovered in the course of any construction activities, the colony should not be disturbed (i.e., no work within 1,500 feet), and the Contractor shall immediately report the findings to the

Engineer so that the U. S. Fish and Wildlife Service or the Tennessee Wildlife Resources Agency may be notified.

3.04 JANITOR SERVICES

A. The Contractor shall furnish daily janitorial services for all the offices, shops, laboratories, or other buildings being used by the Contractor whether existing or Contractor furnished, and perform any required maintenance of the facilities and grounds during the life of the contract. Toilet facilities shall be kept clean and sanitary at all times. Services shall be performed at such a time and in such a manner to least interfere with the operations but will be accomplished only when the buildings are in daily use. Services shall be accomplished to the satisfaction of the Engineer. The Contractor shall also provide weekly trash collection and cleanup of the buildings and adjacent outside areas, snow removal as required, and shall dispose of all discarded debris, aggregate samples and concrete test samples in a manner approved by the Engineer.

3.05 DISPOSAL OF NON-REGULATED DEBRIS

A. All debris resulting from construction operations on this contract shall be disposed of in accordance with Section 31 11 00 "Clearing and Grubbing."

3.06 DISPOSAL OF HAZARDOUS AND/OR REGULATED SOIL WASTES

A. If any hazardous or regulated solid wastes will be generated as a result of the Contractor's operations, the Contractor shall submit a plan that details the proper handling, removal, transportation and disposal of such wastes. The plan shall identify what types of hazardous and/or regulated solid wastes will be generated and shall list the hazards involved with each waste. All waste generated on-site by the Contractor must be properly identified within 30 days of generation. No regulated wastes shall be allowed to accumulate on-site for more than 90 days. The plan shall include Material Safety Data Sheets (MSDS), if applicable, for all wastes expected to be generated. The plan shall include, but not be limited to the following:

1. Hazardous waste shall be placed in closed containers and shall be shielded adequately to prevent dispersion of the waste by wind or water. Any evidence of improper storage shall be cause for immediate shutdown of the project until corrective action is taken.

2. Non-hazardous waste shall be stored in containers separate from hazardous waste storage areas.

3. All hazardous waste shall be transported by a licensed transporter in accordance with Tennessee Code Annotated, § 68-212, and TDEC Rule 1200-1-11.

4. All non-hazardous waste shall be transported in accordance with Local regulations regarding waste transportation.

5. In addition to the number of manifest copies required by TDEC, one copy of each manifest will be supplied to the Engineer prior to transportation.

6. The plan shall identify what types of hazardous and/or regulated solid wastes will be generated and shall list the hazards involved with each waste.

B. Hazardous Waste

1. For the handling, removal, transportation and disposal of any generated hazardous waste, the plan shall conform to the requirements of 29 CFR 1910.120. All employees of the Contractor or subcontractors that will be directly involved in the handling and/or removal of hazardous wastes shall be trained in accordance with 29 CFR 1910.1200. In addition, the employees shall have undergone a medical evaluation in accordance with 29 CFR 1910.1200. The Contractor shall include copies of employees' certifications and medical examinations as part of the plan specified herein. The plan shall also address the proper Personnel Protective Equipment (PPE) that the employees will be required to wear during the handling and removal of hazardous wastes. The Contractor shall obtain an EPA ID# and Hazardous Waste Disposal Manifests and shall sign the manifests as the generator. Wastes shall be transported via State and Federal approved hazardous waste transporter and disposed of at a State and Federal approved temporary, storage and disposal (TSD) facility. Copies of licenses and certifications of the transporter and TSD shall be included in the plan. The plan shall list the name and address of each transporter and TSD to be utilized. The Contractor shall be responsible for any sampling and analysis required by the TSD for characterization purposes. The Contractor shall submit to the Engineer completed copies of all Hazardous Waste Disposal Manifests within five (5) days after ultimate disposal at the TSD. Other regulations applicable to the handling, removal, transportation and disposal of hazardous wastes are: 40 CFR 261 "Identification and Listing of Hazardous Wastes"; 40 CFR 262 "Standard Applicable to Generators of Hazardous Wastes"; 40 CFR 268 "Land Disposal Restrictions".

C. Regulated Solid Wastes

1. For the handling, removal, transportation and disposal of any generated regulated solid wastes, the plan shall conform to the requirements of the TDEC Rule 1200-1-11. Solid wastes shall be transported to a Federal and State approved TSD, oil recycler or Industrial Type Landfill. The Contractor shall identify in the plan how he/she intends to dispose of each solid waste. The plan shall include the name, address, licenses and certifications of each disposal facility that will be used. If disposal manifests are required, the Contractor shall sign them as the generator. The Contractor shall be responsible for sampling and analyses that may be required by the disposal facility(ies) for characterization purposes. Licenses and certifications of the transporter and disposal facilities shall be included in the plan. The Contractor shall submit to the Engineer a completed copy of any waste disposal manifests within five (5) days after ultimate disposal.

D. Laboratory Accreditation.

1. All laboratory testing for waste determination shall be performed by a laboratory which is approved by the Tennessee Department of Environment and Conservation. The name and address of the laboratory shall be included in the Waste Classification, Handling, and Disposal Plan.

3.07 MAINTENANCE OF POLLUTION CONTROL FACILITIES

A. During the life of this contract, the Contractor shall maintain all facilities constructed for pollution control under this contract as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to

the extent that pollution is no longer being created. Early in the construction period, the Contractor shall conduct a training course that will emphasize all phases of environmental protection.

3.08 REPORTING OF POLLUTION SPILLS

A. In the event that an oil spill or chemical release occurs during the performance of this contract, the Contractor is required to contact the **National Response Center, telephone number 1-800-424-8802** as soon as possible. The Contractor shall comply with any instructions from the responding agency concerning containment and/or cleanup of the spill.

***** END OF SECTION *****

SECTION 01 41 26.13

STORM WATER POLLUTION PREVENTION PLAN

PART 1 - GENERAL

1.01 SCOPE

A. The work specified in this section consists of the Contractor implementing, and diligently pursuing all measures required in the **Storm Water Pollution Prevention Plan (SWPPP)**. The SWPPP consists of this Section, 01 41 26.13, and any and all attachments including existing and future signed certification statements. The purpose of the SWPPP is to control soil erosion and the resulting sediment to the extent necessary to prevent sediment from leaving the contract rights-of-way and prevent pollution of any water body caused by the runoff from the areas of construction activities under this contract, under the terms of Tennessee General Permit No. TNR100000, Storm Water Discharges From Construction Activities (PERMIT), and as specified herein and shown on the drawings. The requirements of these specifications are supplemental to and shall become part of the overall Environmental Protection Plan required by Section 01 35 43 - "Environmental Procedures." The Contractor shall review the SWPPP to determine requirements for compliance. In addition, the Contractor shall ascertain that his subcontractors have reviewed the Plan, and that they comply with its provisions. The Contractor shall ensure that all subcontractors sign the Certification Statement.

1.02 RELATED DOCUMENTS

A. Section 01 35 43: Environmental Procedures ☑

B. Section 31 35 13: Slope Protection and Erosion Control ☑

B. Section 32 92 19.21: Seeding, Fertilizer and Mulch ☑

1.03 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

1. ASTM D-4491 - Water Permeability of Geotextiles by Permittivity.
2. ASTM D-4533 - Trapezoid Tearing Strength of Geotextiles.
3. ASTM D-4632 - Grab Breaking Load and Elongation of Geotextiles.
4. ASTM D-4751 - Determining Apparent Opening Size of Geotextile.
5. ASTM D-4873 - Identification, Storage, and Handling of Geosynthetic Rolls.
6. Storm Water General Permit for Construction Activities - Tennessee General Permit No. TNR 10-0000.

1.04 MEASUREMENT AND PAYMENT

A. Storm Water Pollution Prevention Plan (SWPPP)

1. No separate measurement or payment will be made for work required by this section.

B. Silt Fence

1. Measurement for silt fences satisfactorily placed will be made by the linear foot. Payment for silt fences as specified herein will be made at the contract unit price per linear foot for "Erosion Control." Price and payment shall constitute full compensation for furnishing all plant, labor, materials and equipment, including geotextile fabric, and performing all operations necessary for the placement and maintenance of silt fences throughout the contract period, including final dressing and cleanup.

C. Straw Bale Barrier

1. Measurement for payment satisfactorily placed will be made by the bale. Price and payment shall constitute full compensation for furnishing straw, stakes, labor, material and equipment, and performing all operations necessary for placement and maintenance of straw bale barriers throughout the contract period.

1.05 DEFINITIONS

A. *Owner* - The Owner is the party that has operational control over plans and specifications including the ability to make changes to those items.

B. *Notice of Intent (NOI)* - A document that is completed and submitted to the Tennessee Department of Environment and Conservation (**TDEC**) as application for coverage to discharge under the PERMIT.

C. *Notice of Termination (NOT)* - A document that is completed and submitted to the TDEC to terminate permission to discharge under the PERMIT.

1.06 IMPLEMENTATION OF SWPPP

A. The Contractor shall implement the Storm Water Pollution Prevention Plan (SWPPP) specified in this section in a manner which will meet the requirements of Section 01 35 43, "Environmental Procedure", and the requirements of the PERMIT.

1. Notice of Intent (NOI)

a. Upon preparation of a complete SWPPP, the NOI will be submitted by the Owner as application for the Contractor's coverage under the terms of the PERMIT. If a specific permit applicable to this construction item has been received from TDEC in response to the NOI, a copy of the specific permit, as well as a copy of the Owner's NOI, will be provided to the Contractor at the Pre-construction Conference. The Contractor shall make any necessary modification to this SWPPP; attach the Contractor's Certification Statement provided at the end of this section to the SWPPP; and certify by signing the statement as the Contractor. The Contractor shall then submit an NOI as application for his/her coverage under the terms of the PERMIT prior to initiating any construction activities. Certified mail is recommended for Contractor's proof of submittal. A

copy of the Contractor's NOI submittal shall be provided to the Engineer at the time of submittal. TDEC will provide a specific permit to the Contractor in response to that NOI submittal. The NOI's of both the Contractor and the Owner, as well as the specific permits in response to the NOI, shall be posted at the job site by the Contractor.

1.07 SUBMITTALS

A. Certificates

1. The Contractor shall submit the Manufacturer's certification of compliance for the geotextile used on the silt fence. All brands of geotextile that are used in construction shall be accepted on the following basis:

   a. At least **30 days** prior to installation, the Contractor shall furnish to the Engineer, in duplicate, a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the geotextile.

   b. The certificate shall contain the signer's title, the name and address of the Contractor, the contract number, and the project name and location.

   c. The mill certificate or affidavit shall attest that the geotextile meets the chemical, physical, and manufacturing requirements stated in this specification.

   d. Geotextiles shall not be delivered to the site until the geotextile certificates are approved by the Engineer.

B. Samples

1. A 4-foot by 12-foot sample of each geotextile that the Contractor plans to use shall accompany the certificate. If seams are to be used, then an additional 4-foot by 12-foot sample of each geotextile containing a sample seam in the center of the geotextile sample shall be submitted with the certificate. Geotextile shall not be delivered to the site until the geotextile samples are approved by the Engineer.

1.08 RECORD RETENTION REQUIREMENTS

A. Records of the NOI as well as any data used to complete it, the SWPPP, and any reports required by the PERMIT shall be retained by the permittee for at least **three years** from the date that the site is finally stabilized. Certification of the SWPPP by the Contractor or any sub-contractor is required in accordance with the PERMIT. Copies of required certifications are attached at the end of this section.

B. A copy of the SWPPP required by the PERMIT, including a copy of the permit language, shall be retained at the construction site (or other local location accessible to TDEC and the public) from the date of construction initiation to the date of stabilization. The permittee with day-to-day operational control over SWPPP implementation shall have a copy of the Plan available at a central location on-site for the use of all operators and those identified as having responsibilities under the Plan whenever they are on the construction site. A notice shall be posted near the main entrance to the construction site with the following information: (1) the PERMIT number for the project or a copy of the NOI if a permit has not yet been assigned; (2) the name and telephone number of a local contact person; (3) a brief description of the project; and (4) the location of the SWPPP if the site is inactive or does not have an on-site location to store the Plan.

C. Inspectors performing the required twice weekly inspections must have an active certification by completing the "Fundamentals of Erosion Prevention and Sediment Control Level I" course. A copy of the certification or training record for inspector certification should be kept on site.

D. The dates of the following activities shall be recorded:

1. Major grading activities occurred.

2. Construction activities temporarily or permanently ceased.

3. Stabilization measures were initiated.

E. Any written correspondence concerning the NOI, NOT, SWPPP, or discharges from any facility covered under the PERMIT, shall be identified by permit number, if one has been assigned. The following is the TDEC mailing address:

Tennessee Department of Environment and Conservation
Division of Water Resources
1221 South Willow Avenue
Cookeville, Tennessee 38506

1.09 MAINTENANCE AND SURVEILLANCE FEES

A. The Contractor shall, without additional expense to the Owner, be responsible for paying any State required annual maintenance and surveillance fee for work associated with coverage under the PERMIT.

1.10 EROSION AND SEDIMENT CONTROLS

A. The controls and measures required for controlling sediment during construction are described below:

1. Stabilization Controls -

a. The stabilization practices to be implemented shall include fertilizing, seeding, and mulching as specified in Section 32 92 19.21. On a daily report, the Contractor shall record the dates when the major grading activities occur, (e.g., clearing and grubbing, excavation, embankment, and grading); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Except as provided in (1) and (2) below, stabilization practices shall be initiated as soon as practicable, but no more than **7 days**, in any portion on the site where construction activities have temporarily or permanently ceased.

(1). Unsuitable Conditions - Where the initiation of stabilization measures by the **7th day** after construction activity temporarily or permanently ceases is precluded by unsuitable conditions caused by the weather, stabilization practices shall be initiated as soon as practicable after conditions become suitable.

(2). No Activity for Less Than 15 Days - Where construction activity will resume on a portion of the site within **15 days** from when activities ceased (e.g., the total time period that construction

activity is temporarily ceased is less than **15 days**), then stabilization practices do not have to be initiated on that portion of the site by the **7th day** after construction activity temporarily ceased. Stabilization practices shall be initiated on that portion of the site by the **7th** day in the case where construction activities will not resume within **15 days** after construction activities have ceased.

2. Structural Controls

a. Structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Location and details of installation and construction are shown on the drawings.

(1) Silt Fence Barrier - The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed, as shown on the contract drawings, to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g., clearing and grubbing, excavation, embankment, and grading). Silt fences shall be installed in the locations indicated on the drawings. Final removal of silt fence barriers shall be upon approval by the Engineer.

PART 2 - PRODUCTS

2.01 COMPONENTS FOR SILT FENCE BARRIER

A. Filter Fabric

1. The geotextile shall comply with the requirements of the following table, and shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall meet the following requirements:

FILTER FABRIC FOR SILT SCREEN FENCE

PROPERTY	TEST PROCEDURE	VALUE
Grab Tensile Strength, lbs	ASTM D-4632	100 minimum
Grab Elongation at Ultimate, percent	ASTM D-4632	40 maximum
Puncture Strength, lbs	ASTM D-4833	30 minimum
AOS, U. S. Standard Sieve No.	ASTM D-4751	30
Water Flow Rate, gpm/sf	ASTM D-4491	25 minimum
Permitivity, per second	ASTM D-4491	.25 minimum
Percent Open Area, percent	Area of Openings/Total Area	4-8

B. Silt Fence Wooden Posts and Steel T-Posts

1. The Contractor may use either rounded wooden posts or steel T-posts for silt fence construction. Wooden posts utilized for silt fence construction, shall conform to the contract drawings and shall be either oak or pine wood. Steel T-posts utilized for silt fence construction, shall have a minimum weight of 0.75 pounds per linear foot and a minimum length of 7 feet.

PART 3 - EXECUTION

3.01 INSTALLATION OF SILT FENCE BARRIER

A. The silt fence shall be located and installed as indicated on the contract drawings. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at a support post, with a minimum 6 inch overlap, and securely sealed. A trench shall be excavated approximately 4 inches wide and 6 inches deep on the upslope side of the location of the silt fence. The 4-inch by 6-inch trench shall be backfilled and the soil compacted over the filter fabric. The geotextile shall be attached to the land side of the post with wire or other method recommended by the manufacturer and such that an eight inch length of geotextile is left unattached at the bottom of the post, the unattached geotextile embedded in the trench and the trench backfilled. It is the responsibility of the Contractor to maintain the integrity of the silt fence. Any deficiencies shall be immediately corrected by the Contractor. The silt fence shall be promptly repaired or replaced should it become damaged or otherwise ineffective. The silt fence is to remain in place upon completion of the project, or as directed by the Engineer. Its maintenance shall be continual for that period of time for which excavated materials are placed in the area of the silt fence.

3.02 IDENTIFICATION, STORAGE AND HANDLING

A. Filter fabric shall be identified, stored and handled in accordance with ASTM D-4873.

3.03 MAINTENANCE

A. The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and

effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures:

1. Silt Fence and Straw Bale Barrier Maintenance

   a. Silt fences shall be inspected in accordance with Section 3.04. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. Sediments shall be utilized in the job or disposed of as construction debris. When a silt fence or straw bale is no longer required, it shall be removed. The immediate area and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with specifications noted on Project plans.

3.04 INSPECTIONS

A. The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and areas where vehicles exit the site **twice weekly**, before anticipated storm events (or series of storm events such as intermittent showers over one or more days) expected to cause a significant amount of runoff, and within **24 hours** of the end of any storm that produces 0.5 inches or more rainfall at the site. Where sites have been finally stabilized, such inspection shall be conducted at least **once every month** if runoff unlikely due to weather (snow, frozen ground, etc.).

B. Inspections

1. Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the SWPPP shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

2. For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWPPP, maintenance performed, and actions taken. The report shall be furnished to the **TDEC within 24 hours** of the inspection as a part of the Contractor's daily report. A copy of the inspection report shall be maintained on the job site. Sample inspection reports are included at the end of this section.

3.05 NOTICE OF TERMINATION

A. Upon stabilization and elimination of all storm water discharges authorized by the PERMIT, or where the operator of all storm water discharges at a facility changes, a Notice of Termination (NOT) shall be certified and submitted by the Contractor to the

TDEC. A copy of the NOT form is provided at the end of this section. Certified mail is recommended for proof of the NOT submittal. The NOT shall be submitted within 30 days of stabilization or assumption of full control of the SWPPP by another operator/permittee over all areas of the site that have not been finally stabilized.

***** END OF SECTION *****

POLLUTION PREVENTION PLAN CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under by direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed: _____
(Owner)

Date: _____

CONTRACTOR'S CERTIFICATION

I certify under penalty of law that I have reviewed this document, any attachments, and the SWPPP referenced above. Based on my inquiry of the construction site owner/developer identified above and/or my inquiry of the person directly responsible for assembling this NOI and SWPPP, I believe the information submitted is accurate. I am aware that this NOI, if approved, makes the above-described construction activity subject to NPDES permit number TNR100000, and that certain of my activities on-site are thereby regulated. I am aware that there are significant penalties, including the possibility of fine and imprisonment for knowing violations, and for failure to comply with these permit requirements.

Signature	For	Responsible for
_____ **(Name & Title)**	**(Company & Address)**	**General Contractor**
_____ **(Name & Title)**	**(Company & Address)**	**General Contractor**
_____ **(Name & Title)**	**(Company & Address)**	**General Contractor**

STORM WATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT FORM

TO BE COMPLETED TWICE WEEKLY AND WITHIN 24 HOURS OF A RAINFALL EVENT OF 0.5 INCHES OR MORE

INSPECTOR: _____ DATE: _____

INSPECTOR'S QUALIFICATIONS:

_____

_____

_____

DAYS SINCE LAST RAINFALL: _____ AMOUNT OF LAST RAINFALL _____ INCHES

STABILIZATION MEASURES

AREA	DATE SINCE LAST DISTURBED	DATE OF NEXT DISTURBANCE	STABILIZED? (YES/NO)	STABILIZED WITH	CONDITION

STABILIZATION REQUIRED:

_____

_____

_____

_____

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

STORM WATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT FORM

STRUCTURAL CONTROLS

DATE: _____

EARTH DIKE:

FROM	TO	IS DIKE STABILIZED	IS THERE EVIDENCE OF WASHOUT OR OVER-TOPPING?

MAINTENANCE REQUIRED FOR EARTH DIKE:

_____

_____

_____

_____

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

STORM WATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT FORM

SEDIMENT BASIN:

DEPTH OF SEDIMENT IN BASIN	CONDITION OF BASIN SIDE SLOPES	ANY EVIDENCE OF OVERTOPPING OF THE EMBANKMENT?	CONDITION OF OUTFALL FROM SEDIMENT BASIN

MAINTENANCE REQUIRED FOR SEDIMENT BASIN:

_____

_____

_____

_____

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

OTHER CONTROLS

STABILIZED CONSTRUCTION ENTRANCE:

DOES MUCH SEDIMENT GET TRACKED ON TO ROAD?	IS THE GRAVEL CLEAN OR IS IT FILLED WITH SEDIMENT?	DOES ALL TRAFFIC USE THE STABILIZED ENTRANCE TO LEAVE THE SITE?	IS THE CULVERT BENEATH THE ENTRANCE WORKING?

MAINTENANCE REQUIRED FOR STABILIZED CONSTRUCTION ENTRANCE:

_____

_____

_____

_____

TO BE PERFORMED BY: _____ ON OR BEFORE: _____

STORM WATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT FORM

CHANGES REQUIRED TO THE POLLUTION PREVENTION PLAN:

_____

_____

_____

_____

REASONS FOR CHANGES:

_____

_____

_____

_____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SIGNATURE: _____ DATE: _____

SECTION 31 35 13

SLOPE PROTECTION AND EROSION CONTROL

PART 1 – GENERAL

1.01 WORK INCLUDED

A. This section shall consist of temporary and/or permanent control measures as shown in the plans or directed by the Engineer during the life of the Contract to control erosion and water pollution, through the use of berms, dikes, dams, sediment basins, fiber mats, netting, mulches, grasses, slope drains, temporary silt fences, and other control devices.

B. The temporary pollution control provisions contained herein shall be coordinated with the permanent erosion control features, to assure economical, effective, and continuous erosion control throughout the construction and post-construction period.

C. This section shall be utilized by the contractor to prepare and submit to the Engineer a Stormwater Control Plan as required by Federal and State Regulations. The Contractor will be responsible for meeting all of the requirements for stormwater permitting if the project will consist of more than one (1) acres of disturbed area.

D. The Contractor shall perform all work in strict accordance with any Aquatic Resources Alteration Permits, Army Corps of Engineers 404 Permits, TVA 26A Permits, and any other Environmental Permits issued for the project.

1.02 RELATED DOCUMENTS

A. Section 31 11 00: Clearing and Grubbing. ❑

B. Section 31 23 36: Grading, Excavation, and Backfill. ❑

C. Section 32 92 19.21: Seeding, Fertilizer, and Mulch. ☑

1.03 REFERENCES

A. Tennessee Erosion & Sediment Control Handbook, Tennessee Department of Environment and Conservation, Latest Edition.

B. Tennessee Rule 1200-4-10.

PART 2 – PRODUCTS

2.01 TEMPORARY BERMS

A. A temporary berm is constructed of compacted soil, with or without a shallow ditch, at the top of fill slopes of transverse to centerline on fills.

B. These berms are used temporarily at the top of newly constructed slopes to prevent excessive erosion until permanent controls are installed or slopes stabilized.

2.02 TEMPORARY SLOPE DRAINS

A. A temporary slope drain is a facility consisting of coarse aggregate, riprap, rock channel protection, fiber mats, plastic sheets, concrete or asphalt gutters, half-round pipe, metal pipe, plastic pipe, sod or other material acceptable to the Engineer that may be used to carry water down slopes to reduce erosion. Such material shall be approved by the Engineer before being incorporated into the work. Sediment pits may be included as part of slope drain construction.

2.03 SEDIMENT STRUCTURES

A. Sediment basins, ponds, and traps are prepared storage areas constructed to trap and store sediment from erodible areas in order to protect properties and stream channels below the construction areas from excessive siltation. Sand or filter fabric may be required.

2.04 CHECK DAMS

A. Check dams are barriers composed of logs and poles, large stones or other materials placed across a natural or constructed drainway.

B. Stone check dams shall not be utilized where the drainage area exceeds fifty (50) acres. Log and pole structures shall not be used where the drainage area exceeds five (5) acres.

2.05 TEMPORARY SEEDING AND MULCHING

A. Temporary seeding and mulching are measures consisting of seeding, mulching, fertilizing, and matting utilized to reduce erosion. All cut and fill slopes including waste sites and borrow pits shall be seeded when and where necessary to eliminate erosion.

2.06 BRUSH BARRIERS

A. Brush barriers shall consist of brush, tree trimmings, shrubs, plants, and other approved refuse from the clearing and grubbing operation.

B. Brush barriers are placed on natural ground at the bottom of fill slopes, where the most likely erodible areas are located to restrain sedimentation particles.

2.07 BALED HAY OR STRAW CHECKS

A. Baled hay or straw erosion checks are temporary measures to control erosion and prevent siltation. Bales shall be either hay or straw containing five (5) cubic feet or more of material.

B. Baled hay or straw checks shall be used where the existing ground slopes toward or away from the embankment along the toe of slopes, in ditches, or other areas where siltation erosion or water run-off is a problem.

2.08 TEMPORARY SILT FENCES

A. Silt fences are temporary measures utilizing woven wire or other approved material attached to posts with filter cloth composed of burlap, plastic filter fabric, etc., attached to the upstream side of the fence to retain the suspended silt particles in the run-off water.

2.09 SANDBAG COFFERDAMS

A. Cofferdams shall be constructed as detailed in plans whenever a stream crossing is required or work is necessary in a stream channel.

2.10 RIPRAP

A. Riprap is a permanent, erosion-resistant ground cover of large, loose, angular stone. This method is utilized to protect the soil surface from the erosive forces of concentrated runoff; to slow the velocity of concentrated runoff while enhancing the potential for infiltration; and to stabilize slopes with seepage problems and/or non-cohesive soils. Riprap, as appropriate, may be used at storm drain outlets, on channel banks and/or bottoms, roadside ditches, drop structures, at the toe of slopes, etc.

PART 3 – EXECUTION

3.01 PROJECT REVIEW

A. Prior to the Preconstruction Conference, the Contractor shall meet with the Engineer and go over in detail the expected problem areas in regard to the erosion control work. Different solutions should be discussed so that the best method might be determined. It is the basic responsibility of the Contractor to develop and submit an erosion control plan acceptable to the Engineer.

3.02 PRECONSTRUCTION CONFERENCE

A. At the Preconstruction Conference, the Contractor shall submit for acceptance a Stormwater Control Plan, which includes his schedule for accomplishment of temporary and permanent erosion control work, as are applicable for clearing and grubbing, grading, bridges and other structures at watercourses, construction, and paving. He shall also submit for acceptance his proposed method of erosion control on haul roads and borrow pits and his plan for disposal of waste materials. No work shall be started until the erosion control schedules and methods of operations have been accepted by the Engineer.

3.03 CONSTRUCTION REQUIREMENTS

A. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, the surface of erodible earth material exposed by excavation, borrow and fill operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, or other water impoundment. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, mats, seeding or other control devices or methods as necessary to control erosion. Cut and fill slopes shall be seeded and mulched as the excavation proceeds to the extent directed by the Engineer.

B. The Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in his accepted schedule. Temporary pollution control measures shall be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

C. Where erosion is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise erosion control measures may be required between successive construction stages. Under no conditions shall the surface area of erodible earth material exposed at one time by clearing and grubbing, exceed 750,000 square feet without prior approval by the Engineer.

D. The Engineer will limit the area of excavation, borrow, and embankment operations in progress commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent pollution control measures current in accordance with the accepted schedule. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified.

E. In the event of conflict between these requirements and pollution control laws, rules, or regulations or other Federal or State or local agencies, the more restrictive laws, rules, or regulations shall apply.

F. The Contractor shall utilize Best Management Practices (BMP's) to provide the least environmental disturbance.

3.04 CONSTRUCTION OF STRUCTURES

A. Temporary Berms

1. A temporary berm shall be constructed of compacted soil, with a minimum width of 24 inches at the top and a minimum height of twelve (12") inches with or without a shallow ditch, constructed at the top of fill slopes or transverse to centerline on fills. Temporary berms shall be graded so as to drain to a compacted outlet at a slope drain. The area adjacent to the temporary berm in the vicinity of the slope drain must be properly graded to enable this inlet to function efficiently and with minimum ponding in this area. All transverse berms required on the downstream side of a slope drain shall extend across the grade to the highest point at approximately a 10-degree angle with a line perpendicular to centerline. The top width of these berms may be wider and the side slope flatter on transverse berms to allow equipment to pass over these berms with minimal disruptions. When practical and until final roadway elevations are approached, embankments should be constructed with a gradual slope to one side of the embankment to permit the placement of temporary berms and slope drains on only one side of the embankment.

B. Slope Drains

1. Slope drains shall consist of stone gutters, fiber mats, plastic sheets, concrete or asphalt gutters, half-round pipe, metal pipe, plastic pipe, flexible rubber, or other

materials which can be used as temporary measures to carry water accumulating in the cuts and on the fills down the slopes prior to installation of permanent facilities or growth of adequate ground cover on the slopes.

2. Fiber matting and plastic sheeting shall not be used on slopes steeper than 4:1, except for short distances of 20 feet or less.

3. All slope drains shall be adequately anchored to the slope to prevent disruption by the force of the water flowing in the drains. The base for slope drains shall be compacted and concavely formed to channel the water or hold the slope drain in place. The inlet end shall be properly constructed to channel water into the slope drain. Energy dissipaters, sediment basins, or other approved devices shall be constructed at the outlet end of the slope drains to reduce erosion downstream. An ideal dissipater would be dumped rock or a small sediment basin, which would slow the water as well as pick up some sediment. All slope drains shall be removed when no longer necessary and the site restored to match the surroundings.

C. Sediment Structures

1. Sediment structures shall be utilized to control sediment at the foot of embankments where slope drains outlet; at the bottom as well as in the ditch lines atop waste sites; in the ditch lines or borrow pits. Sediment structures may be used in most drainage situations to prevent excessive siltation of pipe structures. All sediment structures shall be at least twice as long as they are wide.

2. When use of temporary sediment structures is to be discontinued, all sediment accumulation shall be removed, and all excavation backfilled and properly compacted. The existing ground shall be restored to its natural or intended condition.

D. Check Dams

1. Check dams shall be utilized to retard stream flow and catch small sediment loads. Materials utilized to construct check dams are varied and should be clearly illustrated or explained in the Contractor's erosion control plan.

2. All check dams shall be keyed into the sides and bottom of the channel a minimum depth of 2 feet. A design is not needed for check dams but some typical designs are shown in the standard plans

3. Stone check dams should generally not be utilized where the drainage area exceeds fifty (50) acres. Log and pole structures should generally not be used where the drainage area exceeds five (5) acres.

E. Temporary Seeding and Mulching

1. Seeding and mulching shall be performed in accordance with the Section 32 92 19.21 "Seeding, Fertilizer and Mulch."

F. Brush Barriers

1. Brush barriers shall consist of brush, tree trimmings, shrubs, plants and other approved refuse from the clearing and grubbing operation. The brush barriers shall be constructed approximately parallel to original ground contour. The brush

barrier shall be compressed to an approximate height of 3 to 5 feet and approximate width of 5 to 10 feet. The embankment shall not be supported by the construction of brush barriers.

G. Baled Hay or Straw Erosion Checks

1. Hay or straw erosion checks shall be embedded in the ground 4 to 6 inches to prevent water from flowing under them. The bales shall also be anchored securely to the ground by wooden stakes driven through the bales into the ground. Bales can remain in place until they rot, or be removed after they have served their purpose, as determined by the Engineer. The Contractor shall keep the checks in good condition by replacing broken or damaged bales immediately after damage occurs. Normal debris clean out will be considered routine maintenance.

H. Temporary Silt Fences

1. Temporary silt fences shall be placed on the natural ground, at the bottom of fill slopes, in ditches, or other areas where siltation is a problem. Silt fences are constructed of wire mesh fence with a covering of burlap or some other suitable material on the upper grade side of the fence and anchored into the soil.

2. The Contractor shall be required to maintain the silt fence in a satisfactory condition for the duration of the project or until its removal is requested by the Engineer. The silt accumulation at the fence may be left in place and seeded, removed, etc., as directed by the Engineer. The silt fence becomes the property of the Contractor whenever the fence is removed.

I. Cofferdams

1. Cofferdams shall consist of sandbags placed in stream channel twenty (20') feet upstream and twenty (20') feet downstream of area where work is to be performed in channel. The sandbag cofferdams shall be connected with corrugated metal pipe, HDPE pipe, or corrugated plastic pipe of sufficient size to handle the flow of the channel.

J. Riprap

1. Stone for riprap shall consist of clean or washed field stone or rough unhewn quarry stone of approximately rectangular shape containing no sand, dust or organic materials and shall be the size designated for the class specified. The thickness of the stone layer shall be as specified on the Plans.

2. When using riprap for slope stabilization it shall be designed so that the natural angle of repose of the stone mixture is greater than the gradient of the slope being stabilized.

3. Riprap for channel stabilization shall be designed to be stable for the condition of bank-full flow in the reach of channel being stabilized. Riprap shall extend up the banks of the channel to a height equal to the maximum depth of flow or to a point where vegetation can be established to adequately protect the channel. The size to be used in a channel bend shall extend upstream from the point of curvature and downstream from the point of tangency a distance of at least 5 times the channel bottom width. The riprap shall extend across the bottom and up both sides of the channel.

4. Where riprap is used only for bank protection and does not extend across the bottom of the channel, riprap shall be keyed into the bottom of the channel to a minimum depth equal to the thickness of the blanket and shall extend across the bottom of the channel the same distance.

3.05 MAINTENANCE

A. The temporary erosion control features installed by the Contractor shall be acceptably maintained by the Contractor until no longer needed or permanent erosion control methods are installed. Temporary controls shall subsequently be removed or replaced when directed by the Engineer. Temporary and permanent erosion control features shall be checked after each measurable rainfall and re-established as necessary. All temporary erosion control items shall be removed before the project is accepted, unless otherwise directed by the Engineer. Removed materials shall become the property of the Contractor.

B. If proper control of soil erosion and sedimentation is not being provided by the Contractor, the Engineer may withhold progress estimates until proper control is achieved.

C. In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of work as scheduled, and are ordered by the Engineer, such work shall be performed by the Contractor at his own expense.

D. Where the work to be performed is not attributed to the Contractor's negligence, carelessness, or failure to install permanent controls and falls within the specifications for work items that has a contract price, the units of work shall be paid for at the proper contract prices.

E. The Contractor shall maintain project records on stormwater structures as required by regulations.

3.06 EROSION CONTROL OUTSIDE PROJECT AREA

A. Temporary pollution control shall include construction work outside the project area where such work is necessary as a result of construction such as borrow pit operations, haul roads and equipment storage sites. Bid price in such cases shall include all necessary clearing and grubbing, construction incidentals, maintenance, and site restoration when no longer needed.

***** END OF SECTION *****

SECTION 32 92 19.21

SEEDING, FERTILIZER AND MULCH

PART 1 – GENERAL

1.01 DESCRIPTION

A. This item shall consist of seeding the areas shown on the plans or as directed by the Engineer in accordance with these specifications.

B. Seeding will include:

Class I seed ☐
or
Class II seed ☑

C. Erosion Control Blanket ☐

1.02 RELATED WORK

A. Test Reports: Results of seed purity and germination tests.

B. Certificates: Manufacturer's certification that materials meet specification requirements.

1.03 JOB CONDITIONS

A. This work is applicable only to areas disturbed or graded under the construction contract and where no grass occurs on existing lawn areas.

B. Existing Conditions: Perform seeding only after preceding work affecting ground surface is completed.

C. Environmental Requirements:

1. Plant seed on unfrozen soil.

2. Do not perform seeding when wind exceeds 15 mph.

3. Do not seed between calendar dates from October 15th to March 15th.

D. Protection: Restrict foot and vehicular traffic from seeded areas after planting to end of the established period.

PART 2 – PRODUCTS

2.01 SEED

A. The kinds of grass, legume, and cover-crop seed furnished shall be those stipulated below. Seed shall conform to the requirements of Fed. Spec. JJJ-S-181.

1. Class I Seeding:

Seed	Portion by Wt.
Kentucky Bluegrass (Poa Pratensis)	40%
Creeping Red Fescue (Festuca Rubra)	40%
Perennial Ryegrass (Lodium Perenne)	20%

2. Class II Seeding:

Seed shall be Kentucky 31 Tall Fescue	85%
Perennial Ryegrass (Lodium Perenne)	15%

3. Temporary Seeding:

Annual Rye or Wheat	100%

B. Class I and II - All grass seeds shall have a minimum purity of 90% and minimum germination of 80%, and shall be sown at a rate of 50 lbs/acre.

C. Temporary Seeding shall have a minimum purity of 90% and sown at a rate of 150 lbs/acre.

D. Seed shall be furnished separately or in mixtures in standard containers with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed.

E. Erosion Control Blanket shall be wood excelsior fiber material covered with a photodegradable plastic mesh as manufactured by American Excelsior Company, Arlington, Texas, or approved equal.

F. Erosion Control Blanket shall be installed on all permanently seeded slopes of 3:1 or steeper.

2.02 FERTILIZER

A. Shall be standard commercial fertilizers meeting:

1. FS O-F-241, Type I, Grade A.

2. The percentages of total nitrogen, available phosphoric acid, and water-soluble potash: 19-19-19.

3. Shall be applied at the rate of 300 lbs/acre, and shall meet the specified requirements of the applicable State and Federal laws.

4. Shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

B. The fertilizers may be supplied in one of the following forms:

1. A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader.

2. A finely-ground fertilizer soluble in water, suitable for application by power sprayers.

3. A granular or pellet form suitable for application by blower equipment.

2.03 AGRICULTURAL LIMESTONE

A. Agricultural Ground Limestone should be applied at the rate of 3 tons/acre.

2.04 SURFACE EROSION CONTROL MATERIAL

A. Surface erosion control material shall conform to the following:

1. Surface Erosion Control Blanket - Blanket shall be machine produced mat of wood excelsior formed from a web of interlocking wood fibers; covered on one side with either knitted straw blanket-like mat construction; covered with biodegradable plastic mesh; or interwoven biodegradable thread, plastic netting, or twisted kraft paper cord netting.

2. Surface Erosion Control Fabric - Fabric shall be knitted construction of polypropylene yarn with uniform mesh openings ¾ to 1-inch square with strips of biodegradable paper. Filler paper strips shall have a minimum life of 6 months.

3. Surface Erosion Control Net - Net shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4-feet wide with mesh openings of approximately 1-inch square.

4. Surface Erosion Control Chemicals - Chemicals shall be high-polymer synthetic resin or cold-water emulsion of selected petroleum resins.

5. Hydrophilic Colloids - Hydrophilic colloids shall be physiologically harmless to plant and animal life without phytotoxic agents. Colloids shall be naturally occurring, silicate powder based, and shall form a water insoluble membrane after curing. Colloids shall resist mold growth.

6. Erosion Control Material Anchors - Erosion control anchors shall be as recommended by the Manufacturer.

PART 3 – EXECUTION

3.01 SOIL FOR REPAIRS

A. Shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the Engineer before being placed.

3.02 ADVANCE PREPARATION AND CLEANUP

A. Yard Areas

1. Shall be Class I Seeding.

2. Shall be raked or otherwise cleared of stones larger than 2-inches in any diameter, sticks, stumps, and other debris, which might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas.

3. Damage by erosion or other causes, shall be repaired by the Contractor. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.

4. When construction is completed, the private property owner's facilities and grounds shall be restored to as good or better than their original condition.

B. Farm Land and Highway Right of Ways

1. Shall be Class II Seeding.

2. Shall be raked or otherwise cleared of stones larger than 3-inches in any diameter, sticks, stumps, and other debris, which might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas.

3. Damage by erosion or other causes, shall be repaired by the Contractor. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.

4. When construction is completed, the disturbed areas shall be restored to as good or better than their original condition.

C. An area to be seeded shall be considered a satisfactory seedbed without additional treatment:

1. If it has recently been thoroughly loosened and worked to a depth of not less than 5-inches as a result of grading operations and;

2. If immediately prior to seeding, the top 3-inches of soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and;

3. If shaped to the required grade.

D. When the area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard:

1. Grass and weeds shall first be cut or otherwise satisfactorily disposed of.

2. The soil then scarified or otherwise loosened to a depth not less than 5-inches.

3. Clods shall be broken and the top 3-inches of soil shall be worked into a satisfactory seedbed by disking, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

3.03 DRY APPLICATION METHOD

A. Fertilizing – Following advance preparations and cleanup, fertilizer shall be uniformly spread at the rate specified.

B. Seeding – Grass seed shall be sown at the rate of 50 lbs. per acre immediately after fertilizing, and the fertilizer and seed shall be raked within the depth range of ⅛ to ¼ inch. Seeds of legumes, either alone or in mixtures, shall be inoculated before mixing or sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is required at other than the seasons shown on the plans or in the special provisions, a cover crop shall be sown by the same methods required for grass and legume seeding.

C. Rolling – After the seed has been properly covered, the seed bed shall be immediately compacted by means of an approved lawnroller, weighing 40 to 65 pounds per foot of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per foot of width for sandy or light soils.

3.04 WET APPLICATION METHOD

A. General – The Contractor may elect to apply seed and fertilizer by spraying them on the previously prepared seedbed in the form of an aqueous mixture and by using methods and equipment described herein. The rates of application shall be as specified in Section 3.03 of these specifications. No seed shall be placed on a frozen seedbed.

B. Spraying Equipment – The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

1. The unit shall also be equipped with a pressure pump capable of delivering 100 gallons per minute at a pressure of 100 pounds per square inch. The pump shall be mounted in a line, which will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for ⅝ inch solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be a pressure gauge connected and mounted immediately at the back of the nozzle.

2. The nozzle pipe shall be mounted on an elevated, supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 feet to 100 feet. One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

3. In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet in length shall be provided to which the nozzles may be connected.

3.05 MULCHING

This item shall consist of furnishing, hauling, placing, and securing mulch of surfaces indicated on the plans or designated by the Engineer.

A. MULCH MATERIAL – Acceptable mulch shall be the material listed below or any approved locally available material that is similar to those specified. Low grade, musty, spoiled, partially rotted, hay, or straw will be acceptable. Mulch materials, which contain matured seed of species, which would volunteer and be detrimental to the proposed overseeding, or to surrounding farm land, will not be acceptable. Straw or other mulch material which is fresh and/or excessively brittle, or which is in such an advanced stage of decomposition as to another or retard the planted grass, will not be acceptable.

1. Hay – Shall be native hay, Sudan grass hay, broomsedge hay, legume hay, or similar hay or grass clippings.

2. Straw – Shall be the threshed plant residue of oats, wheat, barley, rye, or rice from which grain has been removed.

B. APPLICATION

1. Before spreading mulch, all large clods, stumps, stones, brush, roots, and other foreign material shall be removed from the area to be mulched. Mulch shall be applied immediately after seeding. The spreading of the mulch may be by hand methods, blower, or other mechanical methods, provided a uniform covering is obtained.

2. Mulch material shall be furnished, hauled, and evenly applied on the area shown on the plans or designated by the Engineer. Straw or hay shall be spread over the surface to a uniform thickness at the rate of 2 to 3 tons per acre (approximately 80 standard bales) to provide a loose depth of not less than 1 ½ inches nor more than 3 inches. Other organic material shall be spread at the rate directed by the Engineer. Mulch may be blown on the slopes and the use of cutters in the equipment for this purpose will be permitted to the extent that at least 95% of the mulch in place on the slope shall be 6 inches or more in length. When mulches applied by the blowing method are cut, the loose depth in place shall be not less than 1 inch, nor more than 2 inches.

C. SECURING MULCH

1. The mulch shall be held in place by one of the following methods:

a. If the "Peg and String" method is used, the mulch shall be secured by the use of stakes or wire pins driven into the ground on 5-foot centers or less. Binder twine shall be strung between adjacent stakes in straight lines and crisscrossed diagonally over the mulch, after which the stakes shall be firmly driven nearly flush to the ground to draw the twine down tight onto the mulch.

b. Light disking to produce a very thin covering of topsoil.

c. Asphalt emulsion applied at a rate of 60 gallons per ton of mulch.

d. Place mulching cloth over seeded area with slopes steeper than 2 to 1.

D. SURFACE EROSION CONTROL MATERIAL

1. Where indicated or as directed, surface erosion control material shall be installed in accordance with Manufacturer's instructions. Placement of the material shall be accomplished without damage to installed material or without deviation to finished grade.

E. MAINTENANCE OF SEEDED AREAS

1. The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the Engineer. Surfaces gullied or otherwise damaged following seeding shall be repaired by regarding and reseeding as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

2. When either the dry or wet application method outlined above is used for work done out of season, between October 15 and March 15, it will be required that the Contractor establish a good stand of grass of uniform color and density to the satisfaction of the Engineer. If, at the time when the contract has been otherwise completed it is not possible to make an adequate determination of the color, density, and uniformity of such stand of grass, payment for the unaccepted portions of the areas seeded out of season will be withheld until such time as these requirements have been met.

3.06 EROSION CONTROL EXCELSIOR BLANKET

A. Installation

1. Install Erosion Control Blanket on permanently seeded areas constructed on a slope of 3 feet horizontal to one foot vertical on slopes when indicated as a construction requirement in Part 1.01.

2. Properly prepare, fertilize and seed area to be covered before blanket is applied. When the blanket is unrolled, netting should be on top and fibers in contact with the soil over the entire area. In ditches, apply blankets in the direction the water flows, butting them at the ends and sides and then stapling. On slopes, apply blankets either horizontally or vertically to slope butt ends and sides and then staple. It is not necessary to dig check slots, anchor ditches or bury ends of blankets unless specified in design specifications.

3. Install material in accordance with manufacturer's recommendation.

4. Secure blanket material with U shaped 0.091" diameter wire with legs six inches in length. Drive staples vertically into the ground at six foot intervals or slopes and four foot intervals along ditches.

5. Use a common row of staples on adjoining blankets.

PART 4 – QUALITY ASSURANCE

4.01 INSPECTION

A. Within five (5) days after acceptance of the bid, the Engineer shall be notified of sources and quantities of mulch materials available and the Contractor shall furnish him with representative samples of the materials to be used. These samples may be used as standards with the approval of the Engineer and any materials brought on the site, which do not meet these standards shall be rejected.

B. Seeding contractor shall supply evidence of quantity and quality of materials used by submitting delivery tickets for seed and fertilizer.

***** END OF SECTION *****